Space Weather Forecast

Issued on Wednesday 26 February 2025 at 13:10 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Isolated Moderate class flares possible. Slight chance of G1 Minor Storms, most likely day 3 (28 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate activity with one Moderate class flare. This peaked slightly before this period at 25/1159 UTC from the combined activity of two sunspot regions in the southwest. These sunspots are now approaching the southwest limb, but remain the most likely source of flaring due to some slight complexity and their potential interaction. There are eight sunspot regions in total across the Earth-facing disc, however the majority of these are small and simple. The next most complex region is in the northeast, however this remains relatively simple.

An eruption of a filament, which is a line of material held above the Suns surface by its magnetic field, was observed was observed around 26/0600 UTC. This is still under analysis to see if any Coronal Mass Ejection (CME) with an Earth-directed component occurred.

Solar Wind / Geomagnetic Activity: The solar wind showed some weak CME influence, and potentially the first signs of the onset of faster solar winds from one of the coronal holes on the Earth-facing disc. Background solar wind speeds were observed until 26/1140 UTC, before rising to be slightly elevated at near 430 km/s. Interplanetary Magnetic Field was Moderate until 26/0630 UTC, when a gradual increasing trend was observed becoming Strong by 26/1200 UTC. The north-south component was mainly Weak to Moderately southward, before rotating to be mainly Moderate to Strong northward from 26/1015 UT. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was above background levels, but below the S1/Minor Radiation Storm and declining.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is forecast with the likelihood of isolated Moderate class flares.

Solar Wind / Geomagnetic Activity: Glancing CME influences are currently not expected, but can't be completely ruled out Days 2-3 (27-28 Feb) from the Moderate flare and filament eruption on 24 Feb. The further filament eruption CME on 26 Feb is still under analysis. The main upcoming enhancement from the large coronal hole on the Earth-facing disc, is likely on Days 2-3 (27-28 Feb),

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with Strong wind speeds of over 600km/s expected. Wind speeds are likely to remain elevated or strong for the rest of the period, once the fast wind connects with Earth. Quiet to Unsettled geomagnetic activity is expected with Active intervals, most likely with the coronal hole onset Days 2-3 (27-28 Feb).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is expected to continue declining towards background. There remains a slight chance of further enhancements.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	60	60	60	60
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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